dophilic, completing their life cycles in host nests, and most species have restricted host ranges and occur only in cool moist climates. The exception is *Ixodes angustus*, the only holarctic species, which is common on a wide variety of hosts. The authors hypothesize that *I. angustus* is similar to the ancestral *Ixodiopsis*, although their phylogenetic analysis actually places it at the tip of one of the two clades.

The chapter of greatest interest to non-tick-specialists concerns zoogeography. The authors present an excellent overview of the formation and ecology of the Bering Land Bridge (Beringia) during the Pleistocene, and the resultant migration of mammals from Eurasia to North America. Based on the phylogenetic analysis and present distribution and host species of *Ixodiopsis*, speciation within the subgenus occurred 1.8–2.2 million years ago, and the subgenus dispersed across Beringia with the first modern microtine rodents. Subsequent speciation events were associated with host switches. These events are paralleled by radiation within the flea family Hystrichopsyllidae.

A hard-cover book of 159 pages may seem a lot to dedicate to only seven species of ticks which are of little direct importance to humans. On the other hand, a worldwide picture of a monophyletic taxon is the result, coupled with an evolutionary analysis based on cladistics, ecology, and geographic distribution.—*George C. Eickwort, Department of Entomology, Comstock Hall, Cornell University, Ithaca, New York 14853-0999.*

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A Synopsis of the Holarctic Miridae (Heteroptera): Distribution, Biology, and Origin, with Emphasis on North America—A. G. Wheeler, Jr. and Thomas J. Henry. 1992. Published by the Entomological Society of America (Lanham, Maryland) as Thomas Say Foundation Volume XV. [v+] 282 pp., 77 distribution maps, 31 figures (habitus line drawings). Hardback. ISBN 0-938522-39-6. Format: 15 by 22.5 cm. ESA Member Price US $30.00. Nonmember Price US $50.00, postpaid. Text in English.

"The study of the geographical distribution of insects is a subject which has received attention from many entomologists, yet one which is still in an infant stage of development."
(J. L. Gressitt, 1958)

Still, nearly a quarter of a century later, we find that little has changed. We have only, at best, a superficial knowledge of the insect fauna of North America. Not only do many species remain to be discovered or named, there are undoubtedly many more immigrant species among our fauna yet to be detected.

Because of the lack of sufficient comparative knowledge of the taxonomy of the forms occurring in both continents, few attempts have been made to estimate the faunal exchange between Europe and North America. The exceptions among the Insecta include such major groups as the Symphyta (Benson, 1962), Noctuidae (Mikkola et al., 1991), Carabidae (Lindroth, 1957; Larson and Langor, 1982), Dytiscidae (Larson and Nilsson, 1985), aleocharine Staphylinidae (Muona, 1984), Psylloidea (Hodkinson, 1980), and Cicadellidae (Hamilton, 1985).

Al Wheeler and Tom Henry, through their collective knowledge of North American plant bugs (the Miridae) and their many years of collecting, have produced a masterful treatise entitled "*A Synopsis of the Holarctic Miridae (Heteroptera): Distribution, Biology, and Origin, with Emphasis on North America.*"

The *Introduction* (Chapter 1) details the history of adventive insects in North America, and, more importantly, provides an overview of the primary literature focusing on adventive organisms as well as literature examples (using insect taxa) of comprehensive comparative analysis of species common to the Palearctic and Nearctic regions. The authors state their own philosophical rationale for why "Holarctic insects—adventive as well as indigenous species—merit attention."

Chapter 2, entitled *Holarctic Miridae in North America,* is divided into two parts. In *Review of Previous Work,* the reader is given a rather complete historical background on mirid studies, from the early to contemporary heteropteran workers who have studied the mirid faunas common to North America and Eurasia. In the section *Terminology and Organization,* the authors, so as to standardize their terminology, provide their definitions to such terms as "Holarctic, indigenous, introduced, and immigrant." Moreover, they also briefly explain how their information on Holarctic species is organized throughout the text.

The heart of the book, the account of species, comprises the remaining chapters (Chapters 3–7; corresponding to the mirid subfamiles). Under each subfamily category, genera are arranged alphabetically and species appear alphabetically within genera. For each species, the information presented appears under the following three headings (which are uniform and standardized throughout the text): *Distribution*—here the first North American record, a summary of recorded Nearctic distribution, new records based on the authors' recent collecting, and a summary of Old World distribution is provided; *Host Plants and Habits*—a review of information available for North America, any new biological data (again based on the authors' recent collecting), and selected Old World literature on habits and immatures; and finally *Zoogeography*—a review of published comments on the probable origin of each species in North America and any additional evidence lending to the interpretation of present-day distributions. "To give a better visual image of its Nearctic distribution pattern," the authors give distribution maps for each species (Maps 1–77). In addition, there is a beautiful frontispiece, and also high-quality line drawings of the habitus of 30 selected mirid species are interspersed among the text.

In the final chapter (Chapter 8, but erroneously labelled 7), entitled *Summary and*

Conclusions, a further comprehensive analysis and discussion of the Holarctic mirid fauna is provided.

Two different and extremely useful indices are presented to assist the reader: one is an index of arthropod names, and the other is an index of plant names (hosts of Holarctic mirids in North America).

The bibliography is amazingly complete and plethoric with more than 580 cited works on indigenous and adventive Miridae in the North Temperate zone.

In conclusion, Wheeler and Henry summarize information for 98 species of Miridae common to North America and the Old World, which are distributed in 5 subfamilies: Bryocorinae (4 species), Deraeocorinae (2 species), Mirinae (40 species), Orthotylinae (17 species), and Phylinae (35 species). They recognize 2 primary categories of North American Holarctic Miridae: an "indigenous element" comprising 37 species (recorded in List 1), and an "adventive element" of 61 species (recorded in Lists 2–5). The 5 lists appear as appendices at the end of the book.

In providing valuable data to basic and applied entomologists, ecologists, systematists, and regulatory personnel, the contents of this monograph by Wheeler and Henry represent one of the most comprehensive assessments of Holarctic members of any North American insect family.

If I have any criticism at all, it is mostly in points of detail. For a book of this length, one would expect to find numerous inconsistencies, typographical errors, or other errors in the text, but this is not the case. The few typographical errors noted include the obvious, inadvertent misspellings of several species names. *Tytthus pygmaeus* is "*Tytthus pymaeus*" in the caption of Figure 18 on p. 142. *Amblytylus nasutus* is "*Amyblytylus nasutus*" in the Hoebeke (1979) and Jewett and Spence (1944) citations of the References Cited section, pp. 233 and 234, respectively. Also, a very trivial point, the Latin phrase *incertae sedis,* meaning: of uncertain taxonomic position, appears as "*insertae sedis*" on p. 151.

One major criticism to be expressed concerns the line illustrations presented for the various mirid taxa. Including the splendid frontispiece of *Stethoconus japonicus,* there are 31 habitus drawings. The majority of these, borrowed from various works, are excellent in their reproduction, with the exception of Figure 19 (p. 149); some of the fine lines and details are lost in this full-page illustration of *Atractotomus magnicornis.* Indeed, habitus drawings of all 98 taxa discussed would have been ideal, but probably not practical. At the very least, a habitus figure of a representative species of *all* treated genera (namely 63 genus-group names) would have been preferred. Twenty habitus figures were of full page dimensions. The remaining 11 figures were reproduced at only half-page dimensions or even less; this was unfortunate as all could have been enlarged to full page.

For all 98 mirid species discussed in this work, both old and new records of North American distribution are given in the text and are plotted as solid and open dots, respectively, on distribution maps. In a number of cases, if one looks closely, there are some minor inconsistencies. For example, some old and/or new distribution records, although cited in the text, have not been plotted as dots on the accompanying maps (10 examples noted). While in other maps, old and/or new distribution records are plotted as dots but there is no accompanying locality data cited in the text (3 examples noted).

Despite these few criticisms, this book is indispensible to anyone at all interested

in the Miridae. Overall, the book must rate as a premier source of information on the plant bug fauna common to North America and Eurasia. In keeping with the style of the authors, this production is well written, superbly organized, and a truly informative reference that is "a must" on the shelves of all individuals and researchers interested in Miridae and Holarctic insect faunas. Among their concluding comments, the authors provide the following quote from Turnbull (1979:193): "How can we detect change in the future if we cannot define the fauna we now have?" With this challenge in mind, Al Wheeler and Tom Henry have done an admirable job in laying an important foundation for future investigators interested in faunal changes in North American Miridae. As it is, this work gives a tremendous wealth of information and the authors are to be congratulated.

For the price, the book is an excellent value, especially if an ESA member. However, it is a pity that the Thomas Say Foundation monographs, one of the showpieces of the Entomological Society of America, are not of higher quality. The text looks camera-ready, is printed on nonglossy paper and of small page dimensions, and is bound in a dull-ordinary, blue binding with no cover design. Can't the Entomological Society of America do better than this? This product could be better marketed if the overall production was vastly improved.—*E. Richard Hoebeke, Department of Entomology, Cornell University, Ithaca, New York 14853-0999.*

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